MTH 255
Mini Test 4

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(8) 1. Let S be the surface whose equation is $z = \frac{2}{3}\left(x^{\frac{3}{2}} + y^{\frac{3}{2}}\right)$ over the square whose vertices in the xy-plane are $(0,0)$, $(1,0)$, $(0,1)$, and $(1,1)$. Find $\iint_S y\, dS$. Round your conclusion to the nearest hundredth.

(8) 2. Let C be the curve of intersection of the plane $-y + z = 2$ and the cylinder $x^2 + y^2 = 1$. Let $\mathbf{F} = \langle 2y, xz, x+y \rangle$. Assuming C is oriented counterclockwise when viewed from above, evaluate $\int_C \mathbf{F} \cdot d\mathbf{r}$.

(9) 3. Let S be the tetrahedron enclosed by the coordinate planes and the plane $6x + 3y + 2z = 6$. Let $\mathbf{F} = \langle z, y, xz \rangle$. Find the flux of $\mathbf{F}$ across S.